

STUDIES OF MYDIDAE (DIPTERA). V. PHYLOGENETIC AND BIOGEOGRAPHIC NOTES, KEY TO THE AMERICAN GENERA AND ILLUSTRATIONS OF SPERMATHECAE*

ESTUDIOS DE MYDIDAE (DIPTERA). V. NOTAS FILOGENÉTICAS Y BIOGEOGRÁFICAS, CLAVE PARA LOS GÉNEROS AMERICANOS E ILUSTRACIONES DE LA ESPERMATECA

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ABSTRACT

The Diochlistinae (comprising the genera *Mitrodetus* Gerstaecker, from Chile, and *Diochlistus* Gerstaecker and *Triclonus* Gerstaecker, from Australia) are considered the sister-group of all the remaining Mydidae. The Diochlistinae present as symplesiomorphy separate veins M_1 and M_2 , and as synapomorphies an elongated scape and the gonostyli internally fused to the hypandrium. The remaining Mydidae have as synapomorphy the fusion of veins M_1 and M_2 . A phylogeny of the three genera of Diochlistinae is presented, with *Mitrodetus* as the sister-group of the genera *Diochlistus* and *Triclonus*. It is postulated that the Diochlistinae and their sister-group were sympatrically distributed all over Pangaea, and that the Diochlistinae were extinct all over that supercontinent, except in Southern South America and Australia. A key to the American genera of Mydidae is presented, and illustrations furnished of the spermathecae of *Mitrodetus*, *Triclonus*, *Anomalomydas*, *Opomydas*, *Heteromydas*,

Pseudorhopalia, *Miltinus*, *Dolichogaster*, *Messiasia*, *Phyllomydas*, *Protomydas*, *Gauromydas*, *Mydas*, *Ceratomydas*, *Mapinguari*, *Nemomydas* and *Pseudonomoneura*.

KEYWORDS: Diptera, Mydidae, America, Taxonomy, Phylogeny, Biogeography, Morphology, Spermatheca.

RESUMEN

Los Diochlistinae (con los géneros *Mitrodetus* Gerstaecker, de Chile, y *Diochlistus* Gerstaecker y *Triclonus* Gerstaecker, de Australia) son considerados el grupo hermano de todo el resto de los Mydidae. Los Diochlistinae presentan, simplemente, las venas M_1 y M_2 separadas y como sinapomorfías el escapo alargado y los gonóstilos internamente hundidos con el hipandrio. Los restantes Mydidae presentan como sinapomorfía la fusión completa de las venas M_1 y M_2 . Se presenta también una filogenia de los tres géneros de Diochlistinae, siendo *Mitrodetus* el grupo hermano de *Diochlistus* y *Triclonus*. Se postula que los Diochlistinae y su grupo hermano (el resto de los Mydidae) se hallaban simpátricamente distribuidos por toda la Pangaea, y que los Diochlistinae se han extinguido en casi todo ese supercontinente, excepto en el Cono Sur de América del Sur y Australia. Se presenta una clave para la identificación de los géneros americanos de Mydidae e ilustraciones de las espermatecas de los géneros *Mitrodetus*, *Triclonus*, *Anomalomydas*, *Opomydas*, *Heteromydas*, *Pseudorhopalia*, *Miltinus*, *Dolichogaster*, *Messiasia*, *Phyllomydas*, *Protomydas*, *Gauromydas*, *Mydas*, *Ceratomydas*, *Mapinguari*, *Nemomydas* y *Pseudonomoneura*.

PALABRAS CLAVES. Diptera, Mydidae, América, Taxonomía, Filogenia, Biogeografía, Morfología, Espermateca.

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INTRODUCTION

Previous parts of this series of papers have dealt with the following subjects: part I with the classification of the Mydidae in subfamilies (Papavero & Wilcox, 1974a); part II with the classification of the Mydinae (Papavero & Wilcox, 1974b); part III with the revision of *Messiasia* d'Andrea (Wilcox & Papavero, 1975); part IVa with the revision of *Phyllomydas* Bigot (Wilcox, 1978), and part IVb with the revision of *Mydas* Fabricius and allied genera (Wilcox, Papavero & Pimentel, 1989).

In this paper we present the basic phylogenetic dichotomy of the Mydidae, a phylogeny of the genera of Diochlistinae, plus a brief biogeographic hypothesis of this group. A key to the identification of the American genera of Mydidae is given, with illustrations of the female spermathecae of some genera.

The material used here belongs to the Museu de Zoologia da Universidade de São Paulo, Brazil and Museo de Zoología de la Universidad de Concepción (MZUC), Chile. The methodology employed in the dissection and preservation of the male terminalia, female spermathecae and other morphological details is the same employed by Artigas (1971).

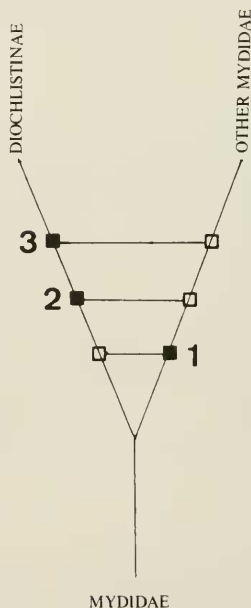
1. THE BASIC DICHOTOMY OF THE MYDIDAE AND THE PHYLOGENY OF THE GENERA OF DIOCHLISTINAE

We hypothesize that the Diochlistinae (comprising the genera *Mitrodetus* Gerstaecker, from Chile and Argentina, and *Diochlistus* Gerstaecker and *Triclonus* Gerstaecker, from Australia) are the sister-group of all the remaining Mydidae. The heterobathmy between these two groups is obtained in the following manner:

1) The Diochlistinae have, symplesiomorphically, separate veins M_1 and M_2 , i.e., they enter the Costa, or the apex of R_1 and the Costa, independently, at or above the wing apex (Figs. 1-2). As synapomorphies they present an elongated scape—the scape is about three times as long as the pe-

dicel (Figs. 4-7)— and the male terminalia shows the gonostyli internally fused to the hypandrium (Figs. 10-12; see also Artigas & Palma, 1979; Figs. 108-125). The wing venation of the Diochlistinae resembles more that of the Apiceridae (see, for instance, the figure of the wing of *Rhaphiomidas acteon* in Peterson, 1981) than that of the Mydidae.

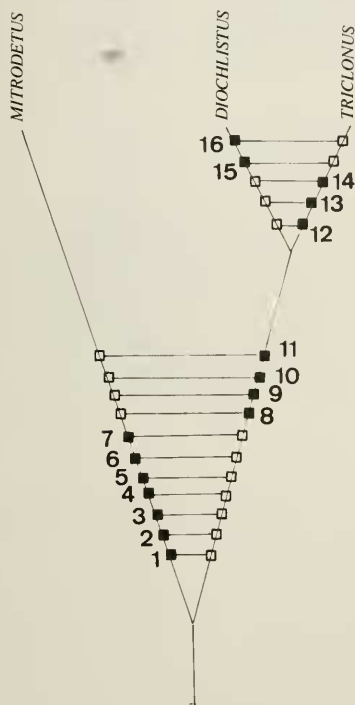
2) The remaining Mydidae show as synapomorphy the complete fusion of veins M_1 and M_2 , i.e., vein M_{1+2} is the only vein that enters C between the apex of the wing and the apex of R_1 ; they show, symplesiomorphically, a short scape (at most twice as long as the pedicel) and the gonostyli are not internally fused to the hypandrium (Textfig. 1):



TEXTFIG 1: Basic dichotomy of the Mydidae. List of apomorphic characters (in parentheses the plesiomorphic state): 1. Veins M_1 and M_2 completely fused in a single vein (M_{1+2}) Veins M_1 and M_2 separate; 2. scape elongate, about three times as long as pedicel (scape not elongate, at most twice as long as pedicel); 3. gonostyli internally fused to the hypandrium (gonostyli not internally fused to the hypandrium).

The phylogenetic interrelationships of the three genera of Diochlistinae are shown in Textfig. 2. The list of characters is the following (plesiomorphic states in parentheses):

1. M_1 ends in R_1 (M_1 ends in C)
2. C ends beyond apex of M_2 (C complete)
3. M_2 ends well above wing apex (M_2 ends slightly above wing apex, far from R_1)
4. R_4 fused to R_5 apically (R_4 free from R_5 apically)
5. Vein $CuA_1 + M_3$ absent ($CuA_1 + M_3$ present)
6. Anatergite pilose (Anatergite bare)
7. Only middle spermatheca present (Three spermathecae present)
8. Katatergite convex, tuberculate and mamiform, pilose (Katatergite convex only, bare)
9. Mid and hind coxae with spines (Coxae without spines)
10. Hind femur clavate (Hind femur not clavate)
11. Hind tibia carinate (Hind tibia cylindrical, not carinate)
12. First flagellomere two or more times as long as scape and pedicel together (First flagellomere subequal in length to scape and pedicel together)
13. Facial gibbosity long (Facial gibbosity short)
14. Katatergite tuberculate (Katatergite only convex, not tuberculate)
15. Mediotergite pollinose (Mediotergite bare)
16. Stem of veins R_4 and R_5 much shorter than stem of M_1 and M_2 between apex of discoidal cell and their bifurcations (Stem of R_4 and R_5 and stem of M_1 and M_2 long and subequal in length as measured between apex of discoidal cell and their bifurcations)



TEXTFIG 2

In the form of a dichotomic key, the three genera of Diochlistinae can therefore be recognized in the following manner:

KEY TO THE GENERA OF DIOCHLISTINAE

1. C. complete; M_1 ends in C or in R_1 , M_2 ends elightly above wing apex, far from R_1 ; R_4 and R_5 free, i. e., ending independently in R_1 ; $CuA_1 + M_3$ present, i. e., cell m_3 petiolate (Fig. 1). Proboscis subequal in length to eye height (Fig. 6). Katatergite ("hy-popleura") from convex to tuberculate and mammiform and pilose. Middle and hind coxae with several long and slender spines. Hind femur clavate on apical half (Fig. 9). Hind tibia with ventral keel (carinate). Anatergite ("postscutellar slopes") bare and shining. (Australia, Tasmania). Length, 12-25 mm 2
- C ends beyond apex of M_2 ; M_1 ends in R_1 ; M_2 ends well above wing apex, in C, near end of R_1 ; R_4 fused to R_5 apically; $CuA_1 + M_3$ absent, i.e., cell m_3 not petiolate (Fig. 2). Proboscis from very short (shorter than length of subcranial cavity) to very elongate (Fig. 4). Katatergite convex, bare of hairs. Hind femur not clavate (Fig. 8). Hind tibia cylindrical. Anatergite long and densely pilose. Only central spermatheca present (Figs. 14-15); see also Artigas & Palma, 1979: Figs. 75-80. Male terminalia and aedeagus as in Figs. 10-13 (see also Artigas & Palma, 1979: Figs. 108-125, 138-139, 140-145). (Chile, Argentina). Length, 11-19 mm *Mitrodetus Gerstaecker*
- 2(1). First flagellomere subequal in length to scape and pedicel together. Facial gibbosity short. Antennal base at about middle of eye height. Subcranial cavity at about 2/5 distance from lower eye margin to base of antennae. Katatergite convex, not tuberculate. Mediotergite pollinose. Stem of R_4 and R_5 much shorter than stem of M_1 and M_2 between apex of discoidal cell and their bifurcations (Spermathecae unknown) *Diochlistus Gerstaecker*.
- First flagellomere two or more times as long as scape and pedicel together. Gibbosity long. Antennal base at almost 2/3 height of eye. Subcranial cavity nearly opposite to lower eye margin. Katatergite tuberculate. Mediotergite bare, shining. Stem of R_4 and R_5 , and stem of M_1 and M_2 long and subequal in length, as measured between apex of discoidal cell and their bifurcations, male terminalia and aedeagus as in Figs. 16-20. Female spermathecae as in Figs. 21-23 *Triclonus Gerstaecker*.

2. VICARIANT BIOGEOGRAPHY OF THE MYDIDAE

Let's denote by D the Dioclistinae, by M the Mydidae and by $C_M D$ the sister-group of the Dioclistinae (i.e., the complement of the Dioclistinae in relation to the Mydidae).

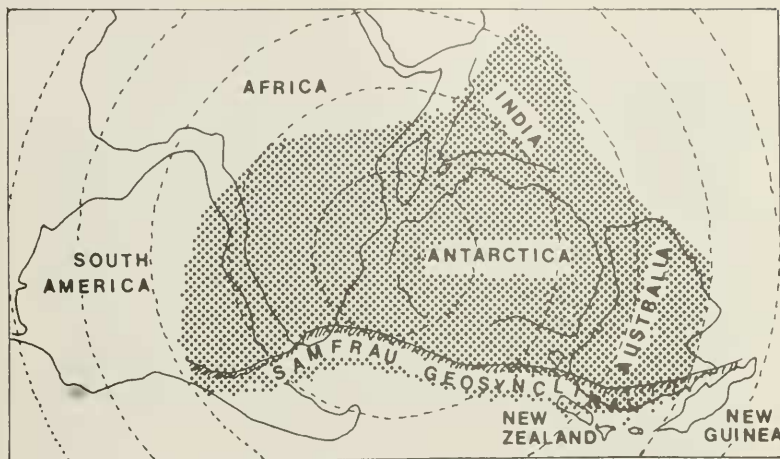
We have that D is distributed in the southern tip of South America, Australia and Tasmania. $C_M D$ is world-wide, being sympatric with D in Southern South America and Australia and Tasmania.

Two hypotheses may be constructed to explain this distribution:

H1) We may postulate that a vicariant event se-

parated Pangaea in two portions: one that included the southernmost portions of that Supercontinent, against all the rest (the greatest part) of it, and that the ancestor of M was distributed all over Pangaea (primitive cosmopolitism). This vicariant event separated M into two distinct lineages, which eventually originated D and $C_M D$ (see textfig. 1). Later, through the disappearance of the barrier which caused this splitting of M or by accidental crossing of that barrier, $C_M D$ dispersed, and entered into sympatry with D, and the biogeographical pattern that we now see was obtained.

We find such a barrier in the Samfrau Geosynclinal, thus called because it interested the southern portion of South America, the southern portion of Africa and parts of Australia (SAM + (A)FR + AU(S) (Textfig. 3):



Textfig. 3. The Samfrau geosynclinal, apud Holmes, 1960.

If the Samfrau Geosynclinal is postulated as having caused the separation of Pangaea and of M, we would have, initially, D distributed "south" of it and $C_M D$ "north" of it. Later on, $C_M D$ dispersed "southwards" (of the Samfrau Geosynclinal), entering into sympatry with D. This pattern remained like that until the present. (For information on the Samfrau Geosynclinal, see, for instance, Harrington, 1942; Holmes, 1960; Theron, 1973).

The great inconvenient of this hypothesis is that we would have to place the origin of M at least in the Upper Carboniferous:

H2) We may postulate that both D and $C_M D$ have arisen by an unknown event of vicariance and were in total sympatry (primitive cosmopolitism) in Pangaea by Cretaceous times, as most (if not all families of Diptera), and that D became extinct all over the Supercontinent, except in Southern South America and Australia (with Tasmania), i.e., that the presence of D only in those two areas of the world is merely fortuitous.

This hypothesis does not involve an exaggerated lowering of the age of the Mydidae, but involves a tremendous extinction of representatives of D.

We will adopt the second alternative, as there are evidences, in other families of Diptera, that

great extinctions have occurred. A spectacular example occurs within the Stratiomyidae. Woodley (1986) has convincingly shown that the Chilean genus *Parhadrestia* James is the sister-group of the genus *Cretaceogaster* Teskey (a fossil from the Canadian amber (Upper Cretaceous)), and that both (united in the subfamily Parhadrestinae by Wooley) are the sister-group of all the other Stratiomyidae. The Parhadrestinae show that they were amply distributed in Pangaea, both in Laurasia (as evidenced by *Cretaceogaster* and in Gondwana (*Parhadrestia*). Only *Parhadrestia* is still living; all the other representatives of Parhadrestinae have been extinct (or were not yet collected) all over the rest of the world.

If the second hypothesis (H2) is accepted, we may predict the existence of fossil Diochlistinae in any part of the world, outside Southern South America and Australia (with Tasmania).

Hypothesis two can also be tested through the establishment of the phylogeny and vicariant biogeography of the sister-group of the Mydidae—the Apioceridae. According to our second hypothesis, the Apioceridae must have a history associated to the splitting of Pangaea into Laurasia and Gondwana, with all the further separations of these land-masses.

3. KEY TO THE AMERICAN GENERA OF MYDIDAE

1. Veins M_1 and M_2 separate, i. e., they enter the Costa, or the apex of R_1 and the Costa, independently, at or above the wing apex (Figs. 1-2). Scape three times as long as pedicel (Figs. 4-7). Male terminalia as in Figs. 10-12 (see also Artigas & Palma, 1979: Figs. 108-125, 138-139, 140-145). Female spermatheca (Figs. 14-15) reduced to only one capsule (see also Artigas & Palma, 1979: Figs. 75-80). (Chile, Argentina). Subfamily Dioclistinae *Mitrodetus* Gerstaecker.
- Veins M_1 and M_2 completely fused, i. e., only one vein enters C between apex of wing and apex of R_1 (Fig. 3). Scape at most two times as long as pedicel 2
- 2(1) First tarsomere of hind leg usually five times as long as wide. Cell cup closed and petiolate. Robust flies, about 11-29 mm long. Hind trochanter with one to five spines. Hypandrium either entirely free from gonocoxites or fused to them only basally; gonostyli present or absent. Female tergite 10 with circlet of strong spines. (Southwestern United States, Mexico). Subfamily Ectyphinae 3
- First tarsomere of hind leg shorter, never five times as long as wide. Other combinations of characters 4
- 3(2). Prementum subequal in length to subcranial cavity, labella short and slightly wider than mentum. Cell r_4 usually closed and short petiolate. Hind tibia with slender apical spur and several bristles; spur small in females of some species. Hypandrium completely free from gonocoxites, gonostyli present (see Wilcox & Papavero, 1971: 101, Figs. 116-118). Female spermathecae as in Figs. 26-27. (United States, Mexico). Length, 18-25 mm. *Opomydas* Curran
- Prementum about one-half length of subcranial cavity, labella attached to prementum near its midpoint and subequal in length to subcranial cavity. Cell r_4 usually broadly open. Hind tibia with apical spur and a bristle at base. Hypandrium fused only basally to gonocoxites, gonostyli absent (see Wilcox & Papavero, 1971: 87, Figs. 82-84). Female spermathecae as in Figs. 28-30. (United States, Mexico). Length, 22-29 mm *Heteromydas* Hardy
- 4(2) Cell r_4 open, usually very widely open 5
- Cell r_4 closed or closed and petiolate 9
- 5(4). Hind tibia cylindrical. (Northeastern Brazil, Chile). Subfamily Rhopalinae 6
- Hind tibia with ventral keel (carinate) (Chile, Argentina, southern Brazil). Subfamily Apiophorinae 7
- 6(5). Vein $CuA_1 + M_3$ present, i. e., cell m_3 closed and petiolate. Labella almost half length of subcranial cavity. Male terminalia: see Artigas & Palma, 1979: Figs. 99-104, 146-149. Female spermathecae as in Fig. 82 of Artigas & Palma, 1979 (Chile). Length, 11-17 mm *Midacritus* Ségué
- Vein $CuA_1 + M_3$ absent, i.e., cell m_3 open. Prementum short and attached to middle of labella, which is slightly shorter than length of subcranial cavity. Male terminalia as in Wilcox & Papavero, 1971: 113, Figs 132-134. Female spermathecae as in Figs. 31-32. (Northeastern Brazil). Length, 10-14 mm *Pseudorhopalia* Wilcox & Papavero

- 7(5). Katepimeron pilose. Abdomen deeply and densely punctate. Alula with fringe of squamose hairs. Female tergite 10 with hairs. Female spermathecae as in Artigas & Palma, 1979, Figs. 81 and 83. Male terminalia: see Figs. 89-92 of Artigas & Palma, 1979. (Chile: Coquimbo to Talca). Length, 18-23 mm *Paramydas* Carrera & D'Andretta
- Katepimeron bare. Other combinations of characters 8
- 8(7). Anal lobe of wing less than 1/2 as broad as long. Alula with fringe of short fine hairs. Hind femur: 4-4.5, 4.5-5 times as long as broad. Female tergite 10 with spines. Male terminalia: see Artigas & Palma, 1979: Figs. 93-98, 134-137. Female spermathecae: see Artigas & Palma, 1979: Figs. 84-86. (Chile: between provinces of O'Higgins and Malleco). Length, 14-19 mm *Apiophora* Philippi.
- Anal lobe of wing about as broad as long. Alula with dense fringe of squamose hairs. Hind femur: ♂ 6, ♀ 7 times as long as broad. Female tergite 10 with spines. (Brazil: Santa Catarina). Length, 21-28 mm *Eumydas* Wilcox & Papavero.
- 9(4). Hind tibia cylindrical. (Americas). Subfamily Mydinae 10
- Hind tibia with ventral keel (carinate). (United States to Peru). Subfamily Leptomydinae ... 21
- 10(9). Prementum about one-half length of subcranial cavity; labella attached to prementum near its midpoint and subequal in length to subcranial cavity. Anterior margin of subcranial cavity situated at about two-fifths distance from lower eye margin to base of antennae 11
- Prementum subequal in length to subcranial cavity; labella attached to prementum near its apical one-half, and extending out at about a 90° angle. Anterior margin of subcranial cavity level with lower eye margin 12
- 11(10). Antenna short, first flagellomere widened apically and subequal in length to scape and pedicel together; second flagellomere as long as the three preceding segments. Vein CuA₁ + M₃ absent. Male terminalia as in Figs. 76-78 of Wilcox & Papavero (1971). Female spermathecae as in Figs. 35-36. (Guiano, Brazilian subregion). Tribe Dolichogasterini. Length, 20-27 mm *Dolichogaster* Macquart
- First flagellomere of antenna slender and at least twice as long as scape and pedicel together; second flagellomere shorter than three preceding segments. Vein CuA₁ + M₃ present. Male terminalia as in Wilcox & Papavero (1975). Female spermathecae as in Figs. 37-38. (United State: Arizona to Argentina: Buenos Aires). Tribe Messiasini. Length, 15-29 mm *Messiasia* d'Andretta.
- 12(10). Facial gibbosity about as broad as high. Female tergite 9 narrower apically than basally. Male terminalia with simple, or bifid and falciform gonostyli. (North and South America). Tribe Mydini. Length, 15-60 mm 13
- Facial gibbosity about one and one-half times as broad as high. Female tergite 9 wider apically than basally, fluted (see Wilcox & Papavero, 1971: Fig. 61). Gonostyli bifid. Female spermathecae as in Figs. 39-40. (United States, Mexico). Tribe Phyllomydini. Length, around 21 mm *Phyllomydas* Bigot.
- 13(12). Hind tibia with ventral keel underdeveloped, visible only on the basal half (or less) of the tibia; apical spur on hind tibia underdeveloped, always shorter than width of first tarsomere (still shorter, almost absent, in female). Epandrium trapezoidal. Female spermathecae as in Figs. 41-42. (Neotropical, except Chile). Subtribe Protomydina, Length, 20-40 mm *Protomydas* Wilcox, Papavero & Pimentel

- Hind tibia with well-developed, very evident ventral keel, all along its length; apical spur of hind tibia well-developed in both sexes (longer in males), always longer than width of first tarsomere (up to two times as long as width of first tarsomere). Epandrium trapezoidal, subtrapezoidal or triangular 14
- 14(13) Mesonotum without a definite pollinose pattern of stripes or spots (Americas). Subtribe Mydina 15
- Mesonotum with a very evident pattern of pollinose stripes or spots. (Neotropical, except Chile). Subtribe Stratiomydina 19
- 15(14). First tarsomere of hind leg long, at least subequal in length to tarsomeres 2-3 and always longer than tarsomere 5 16
- First tarsomere of hind leg very short, subequal in length to tarsomere 2 and always shorter than tarsomere 5 17
- 16(15). Second flagellomere of antenna about six times as long as wide or more. Female spermathecae as in Figs. 43-45. (Neotropical, except Chile) *Gauromydas* Wilcox, Papavero & Pimentel
- Second flagellomere about four times as long as wide or less (five times in *Mydas boonei* Curran). Female spermathecae as in Figs. 46-47. (Mexican, extending to Ne-arctic region) *Mydas Fabricius*
- 17(15). No strong, differentiated bristles on legs. Fore tibia with a dense patch of black and orange-red hairs. Alula broad, with a long, dense fringe of squamose hairs. Abdomen entirely cupreousred as wide as thorax. Female spermathecae as in Figs. 48-49. (Surinam, Brazil: Pará). Length, 29-32 mm *Mapinguari* Papavero & Wilcox.
- Tibia with well-developed bristles. Other combinations of characters 18
- 18(17). Alula narrow, with a short, sparse fringe of hairs. Abdomen slender, narrower than thorax, mostly black, sometimes constricted in the middle. Female spermathecae as in Figs. 50-52. (Neotropical, except Chile). Length, 20-27 mm *Ceratomydas* Williston.
- Alula broad, with dense fringe of squamose hairs. Abdomen strongly petiolate, wasp-like, uniformly red, (Brazil: Pará). Length, 29 mm *Utinga* Wilcox, Papavero & Pimentel.
- 19(14). First tarsomere of hind leg long, subequal in length to tarsomeres 2-3 and longer than tarsomere 5. Epandrium variable 20
- First tarsomere of hind leg very short, subequal in length to tarsomere 2 and shorter than tarsomere 5. Katepimeron pilose (*Baliomydas cubanus* (Curran)) or bare. Epandrium trapezoidal, with a distinct spur on the inner posterior corner. (West Indies) *Baliomydas* Wilcox, Papavero & Pimentel
- 20(19). Tergites 2-5 with the usual sparse, short, recumbent pilosity, directed backwards. Epandrium subtrapezoidal or triangular. Katepimeron bare (sparsely pilose in *Stratiomydas colimas* Wilcox, Papavero & Pimentel). (Tropical lowland forests of Mexico and Central America, Peru) *Stratiomydas* Wilcox, Papavero & Pimentel
- Tergites 2-5 with long, dense, recumbent hairs, directed outwards. Epandrial halves triangular. Katepimeron pilose. (Guiano-Brazilian subregion) *Chrysomydas* Wilcox, Papavero & Pimentel.

21(9). Katatergite bare. Vein $CuA_1 + M_3$ present. Labella attached to prementum at its midpoint and slightly shorter than subcranial cavity. Hind femur about 10 times as long as broad, venter with long hairs and 2-3 subapical spines. Female tergite 10 with apical hairs. (Perú). Length, 12-18 mm *Plyomydas* Wilcox & Papavero.

Katatergite pilose, hairs short and inconspicuous in some females. Vein $CuA_1 + M_3$ absent. Proboscis obsolete to functional, varying from one-half to three times length of subcranial cavity, labella attached to apex of prementum. Female tergite 10 with spines 22

22(21). Second flagellomere of antenna longer than first flagellomere. Gonostyli split apically, with two prongs, the inner one acute and not quite as long as the outer one. Female spermathecae with only two capsules (Figs. 53-54). Canada: British Columbia, to Panamá). Length, 12-23 mm *Nemomydas* Curran

Second flagellomere of antenna shorter than or subequal to length of first flagellomere. Gonostyli divided apically, with a single spur. Female spermathecae with 3 capsules (Figs. 55-56). (United States, México). Length, 9-20 mm *Pseudonomoneura* Bequaert

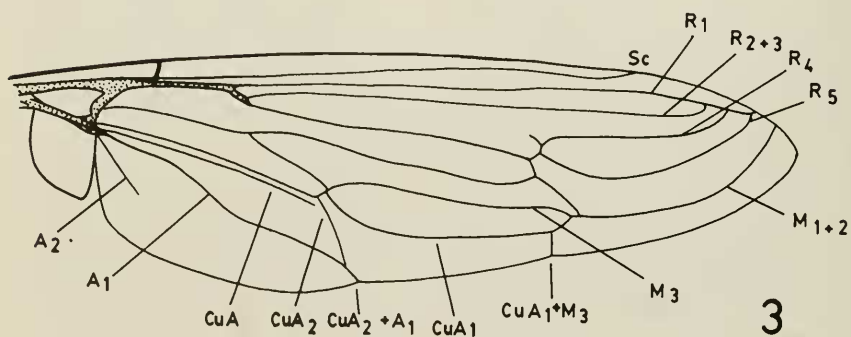
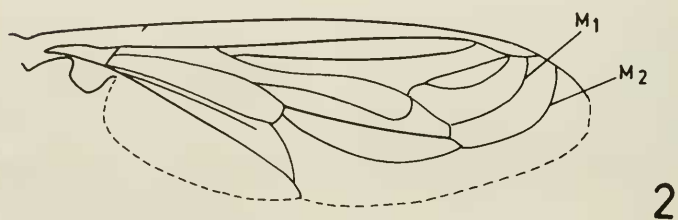
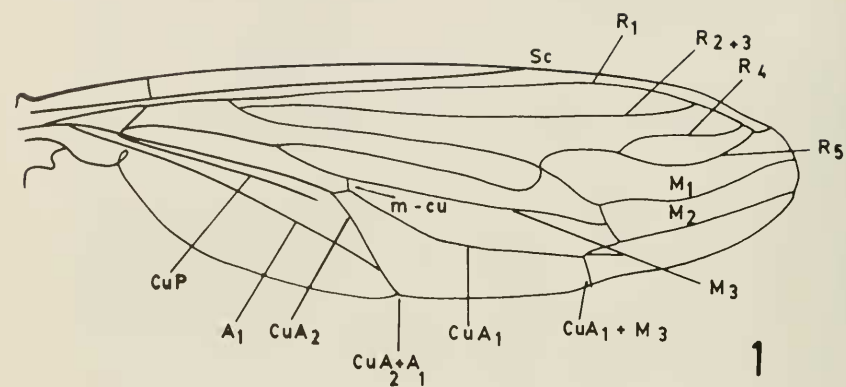
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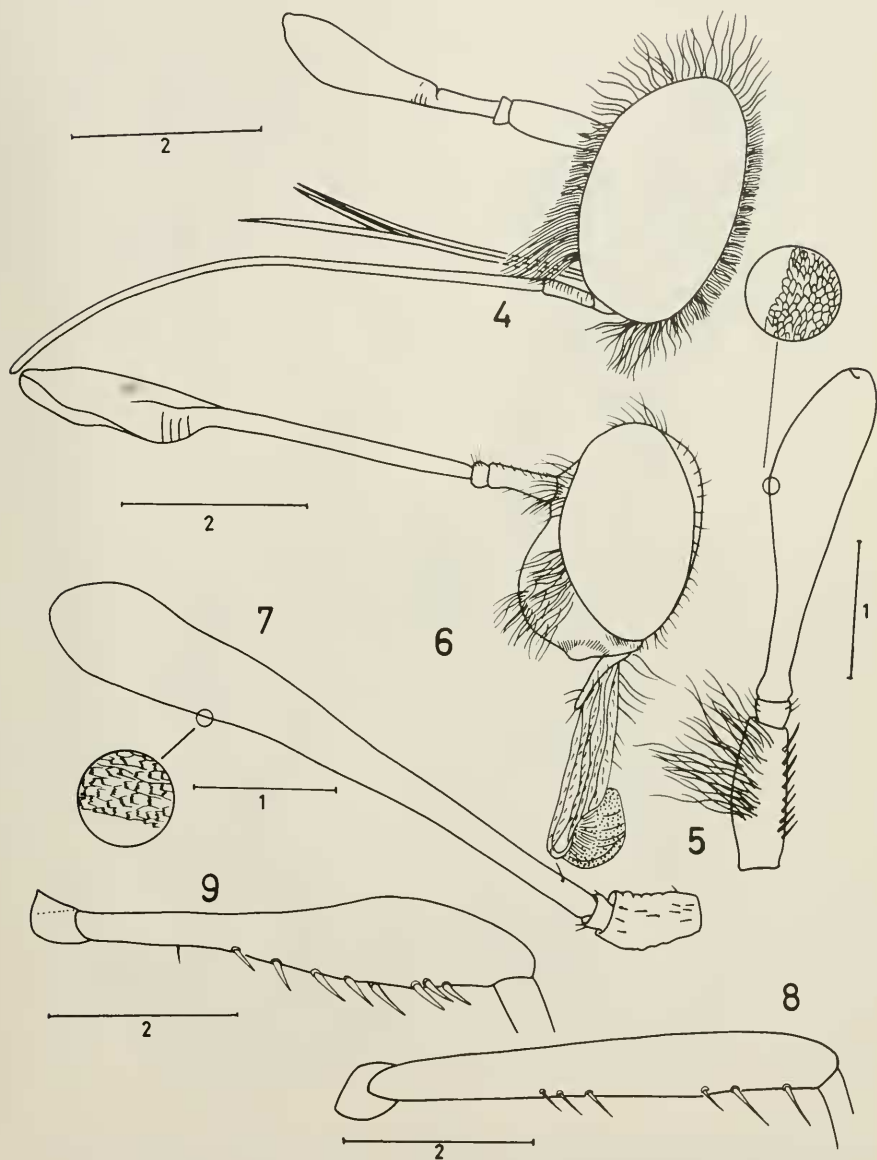
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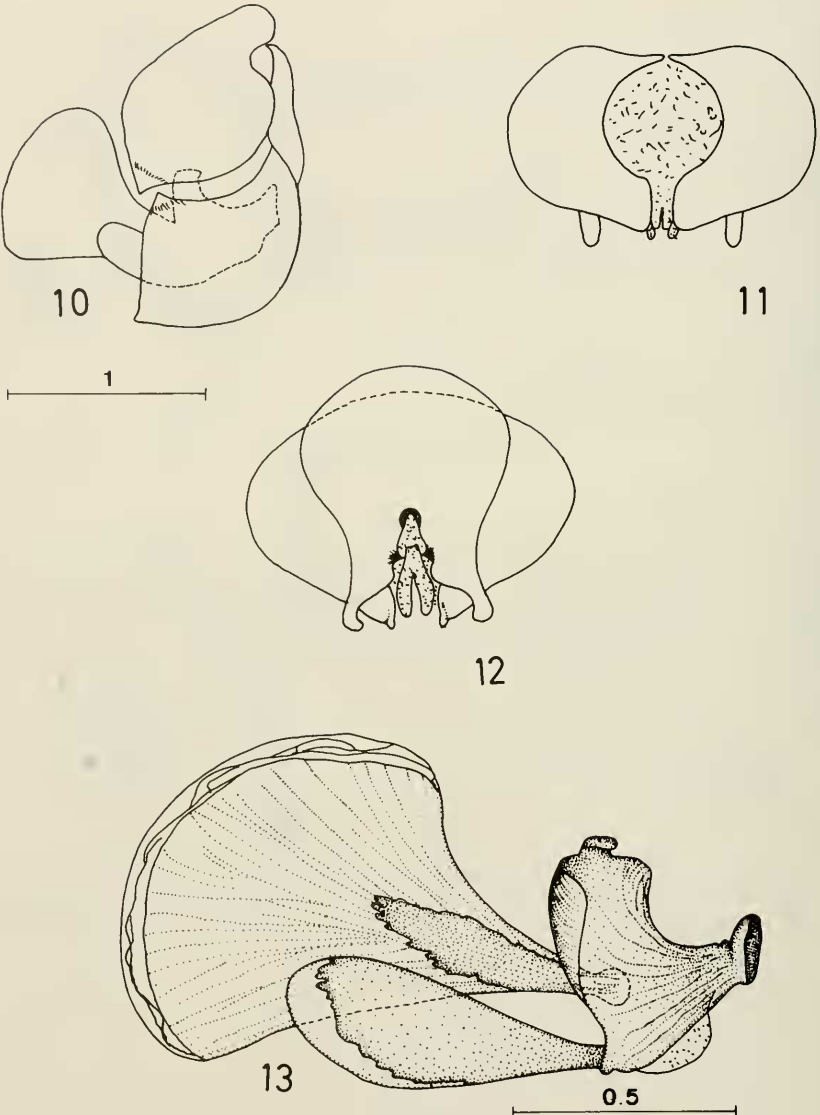
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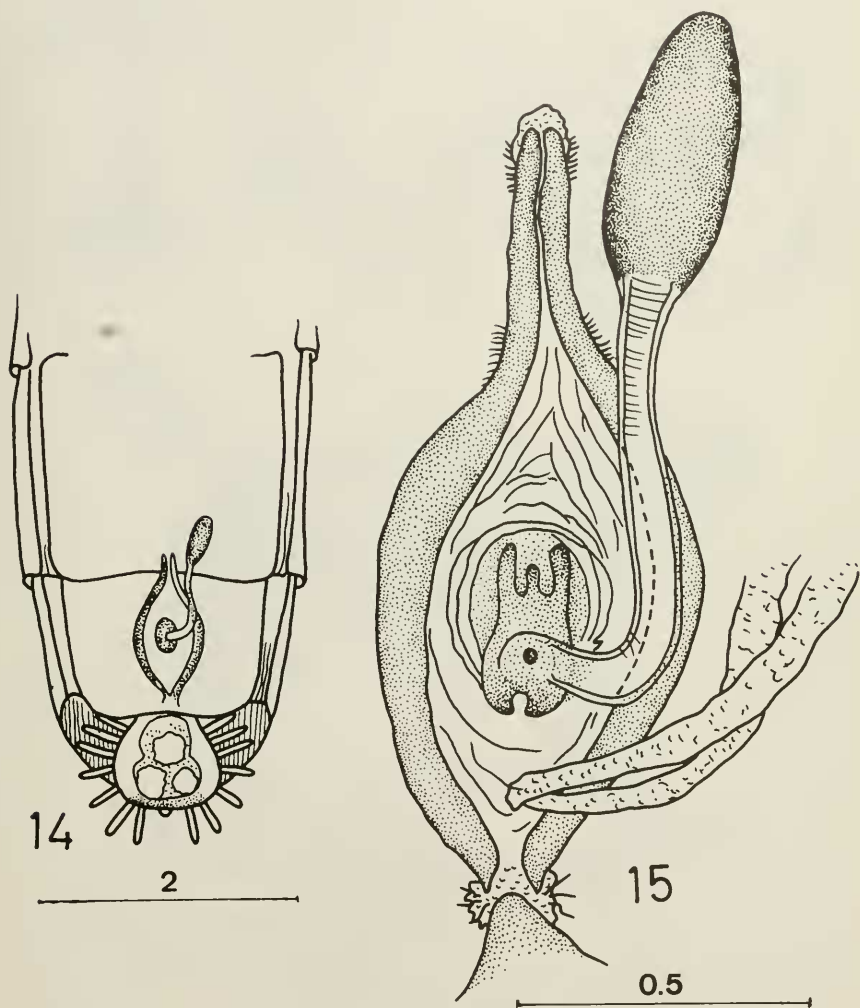
Figs. 1-3. Wings: 1. *Triclonus* sp.; 2. *Mitrodetus* sp.; 3. *Mydas* sp.



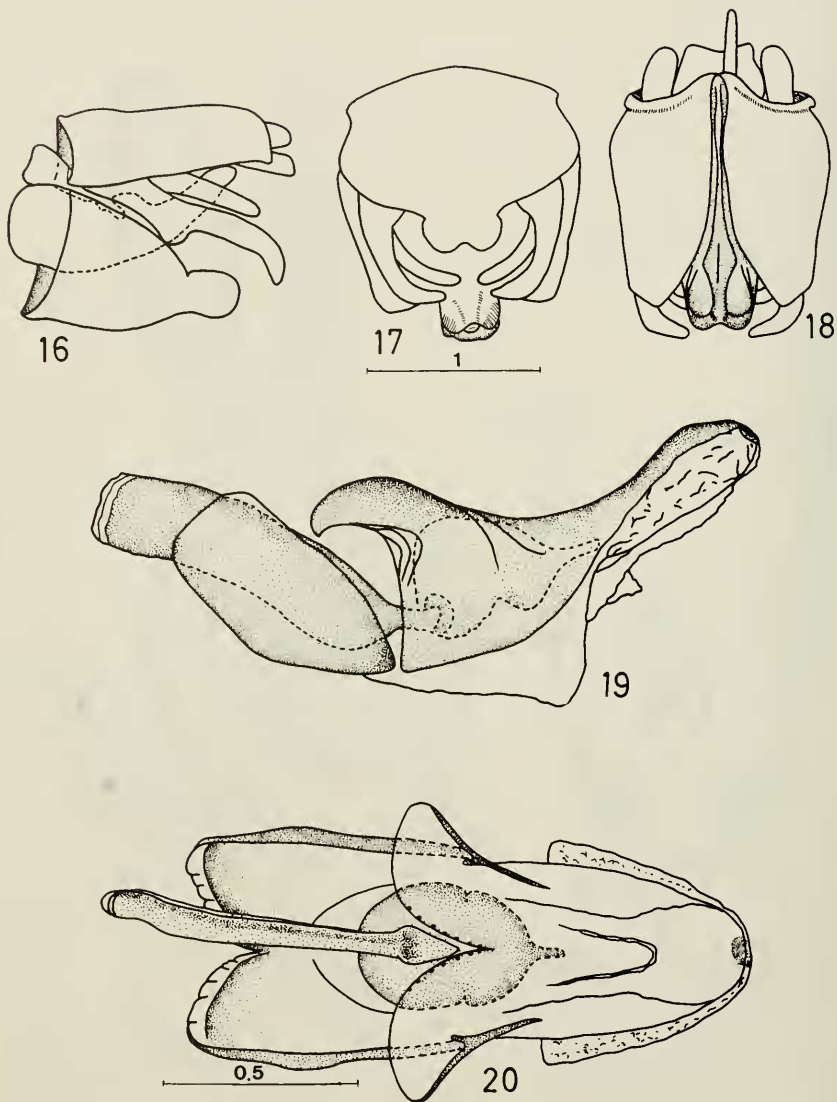
Figs. 4-9. *Mitrodetus* sp.: 4. head. 5. antenna. 8. leg. *Triclonus* sp.: 6. head, 7. antenna, 9. hind femur.



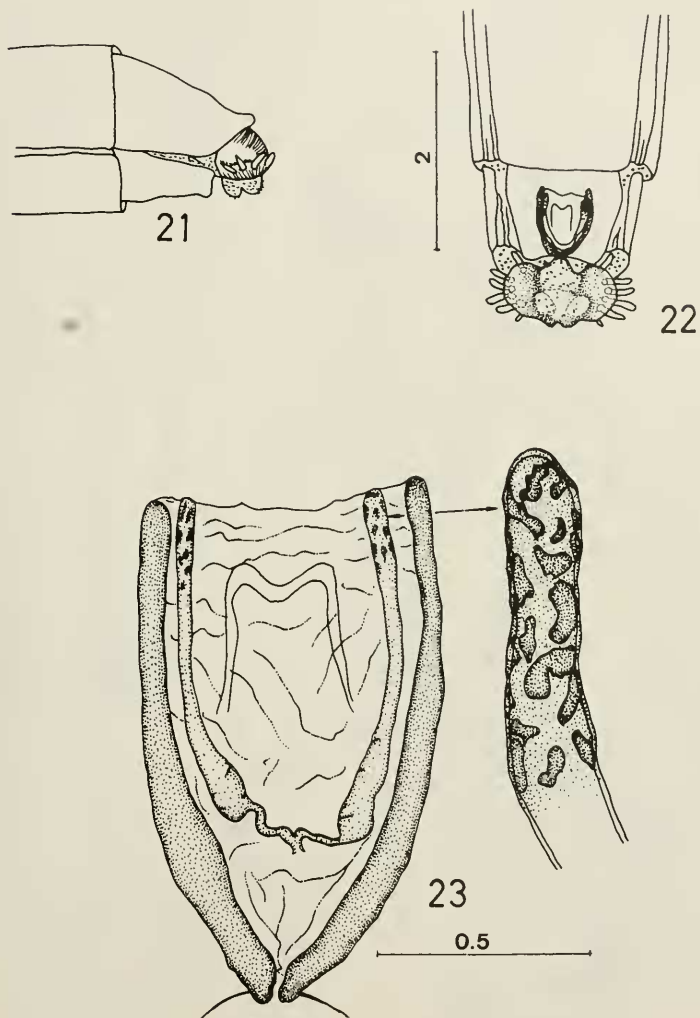
Figs. 10-13. *Mitrodetus dentitarsis* (Macquart): 10. male terminalia in lateral view, 11. same in dorsal view, 12. same in ventral view, 13. aedeagus in lateral view.



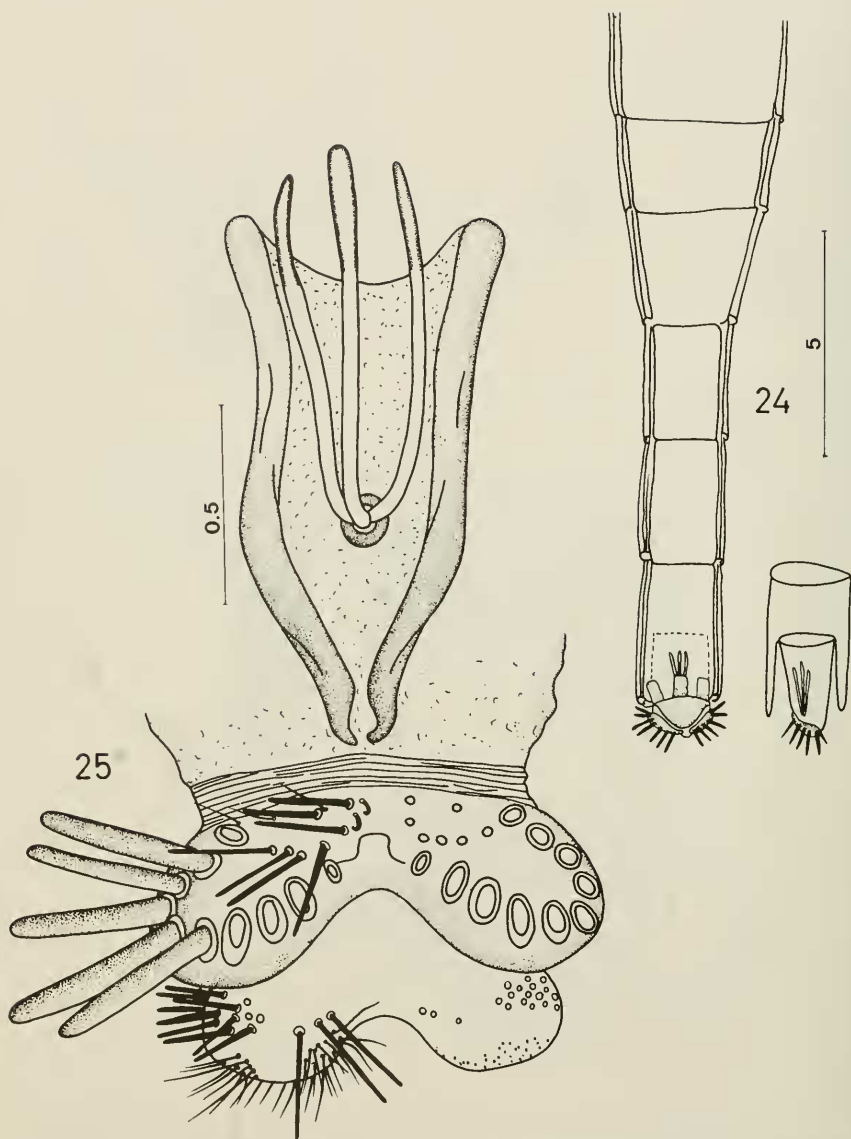
Figs. 14-15. *Mitrodetus dentitarsis* (Macquart): 14. tip of abdomen showing position of spermatheca, 15. spermatheca.



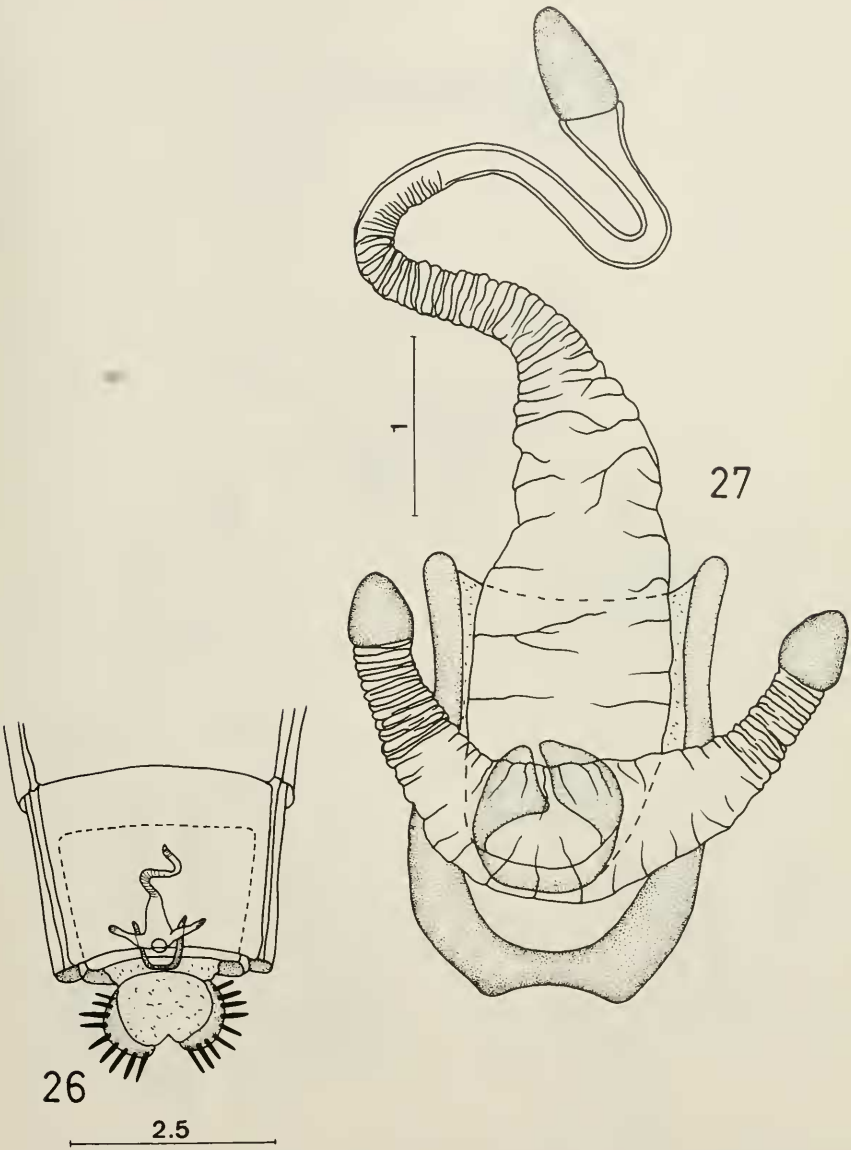
Figs. 16-20. *Triclonus gracilis* (Macquart): 16. male terminalia in lateral view, 17. same in ventral view, 18. same in dorsal view, 19. aedeagus in lateral view, 20. same in dorsal view.



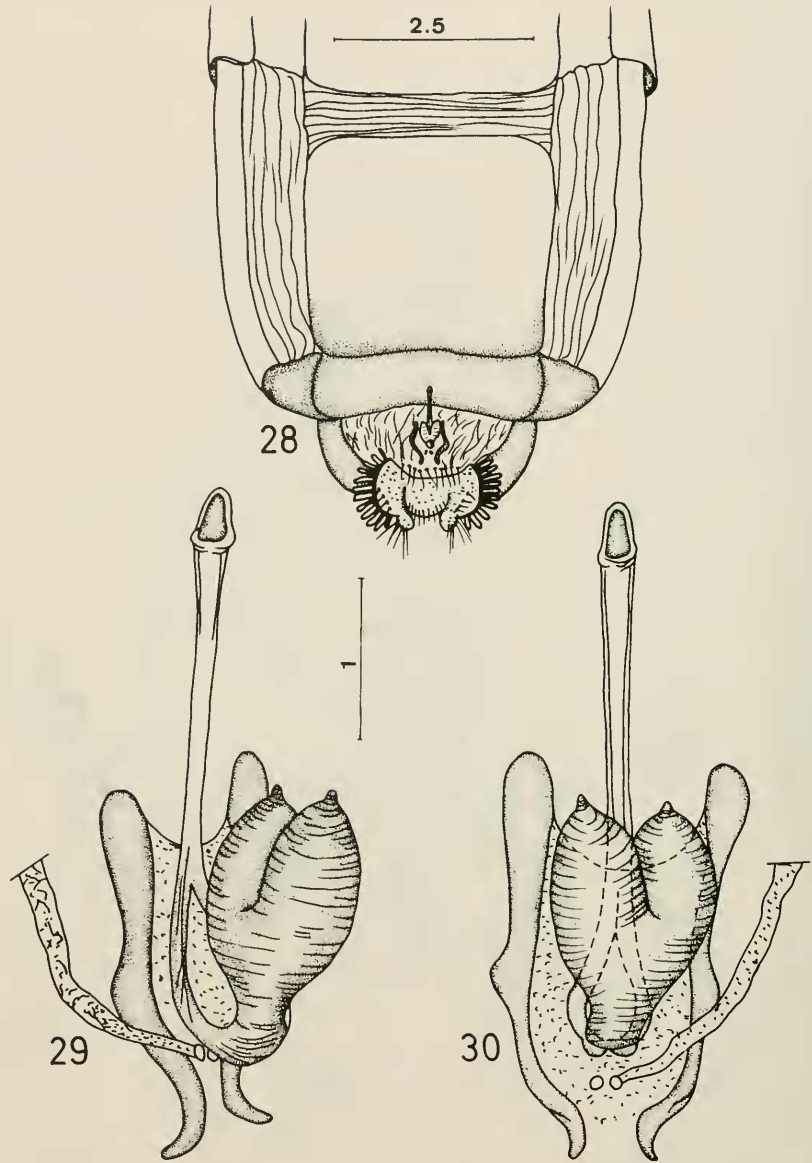
Figs. 21-23. *Triclonus gracilis* (Macquart): 21. apex of abdomen, lateral view, 22. same, dorsal view, showing position of spermathecae, 23. spermathecae with detail of capsule.



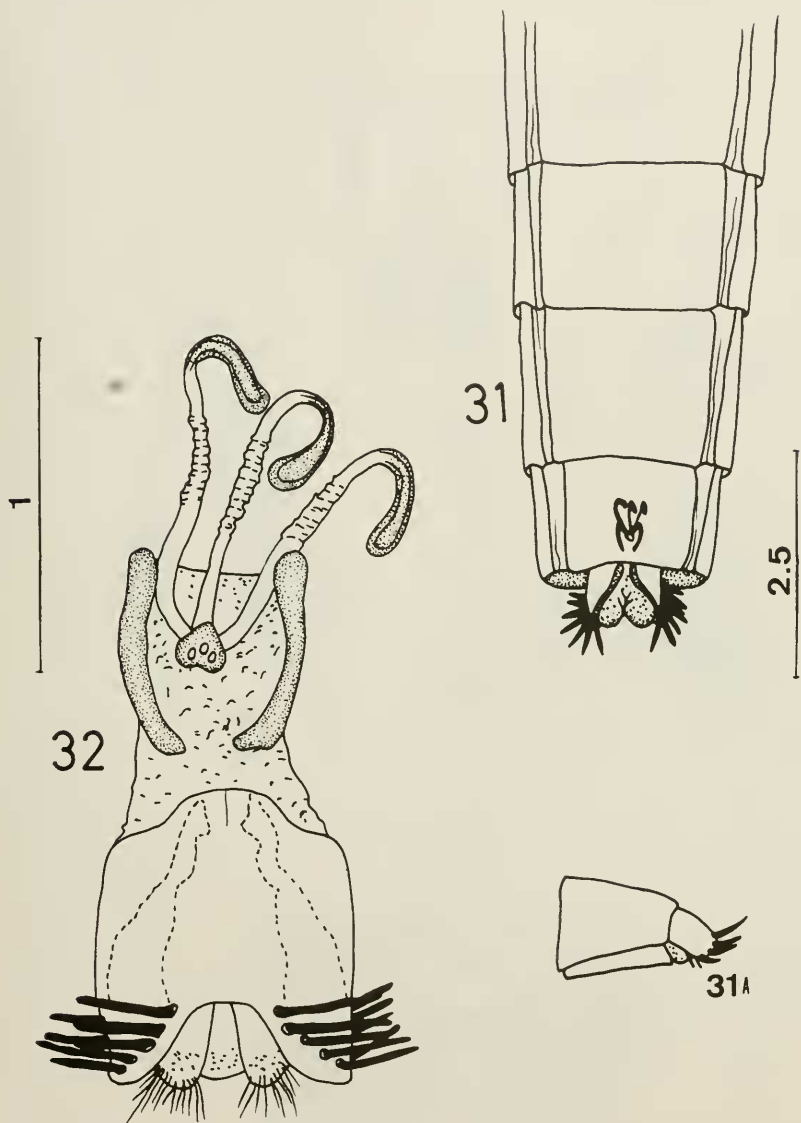
Figs. 24-25. *Anomalomydas mackerrasi* (Norris): 24. tip of abdomen showing position of spermathecae, 25. spermathecae.



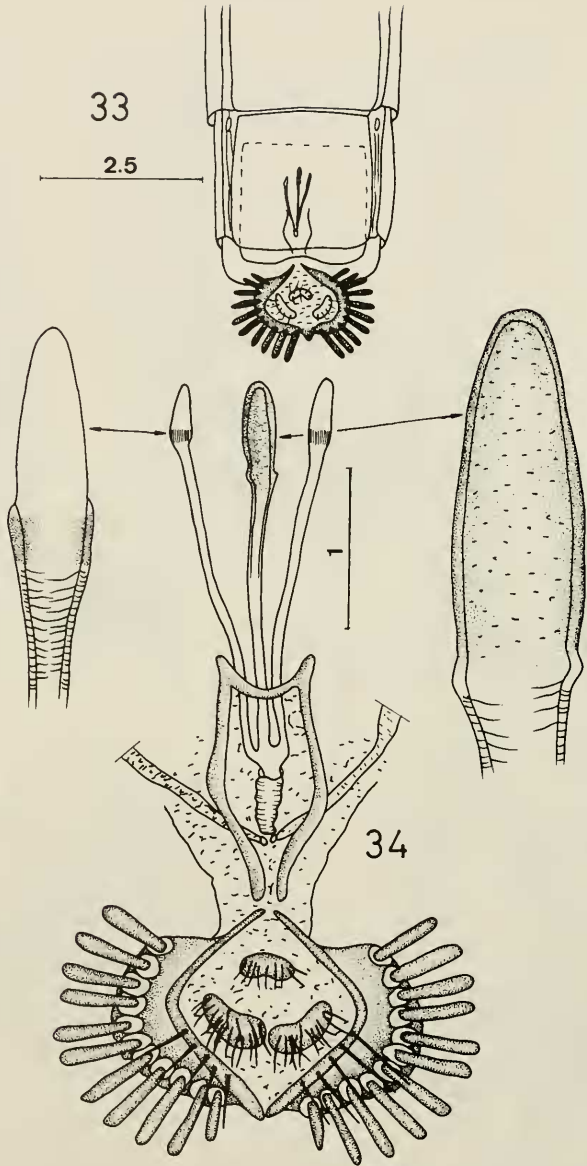
Figs. 26,27. *Opomydas limbatus* (Williston): 26. tip of abdomen showing position of spermathecae, 27. spermathecae.



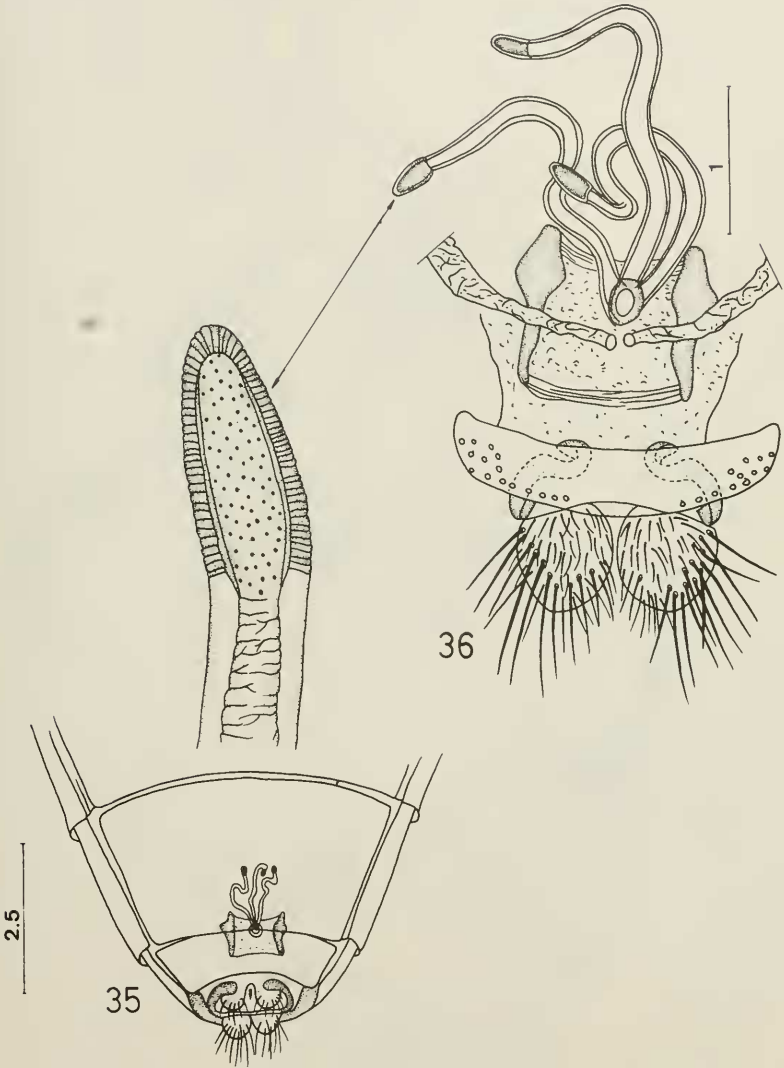
Figs. 28-30. *Heteromydas bicolor* Hardy: 28. tip of abdomen showing position of spermathecae, 29-30. spermathecae, in different views.



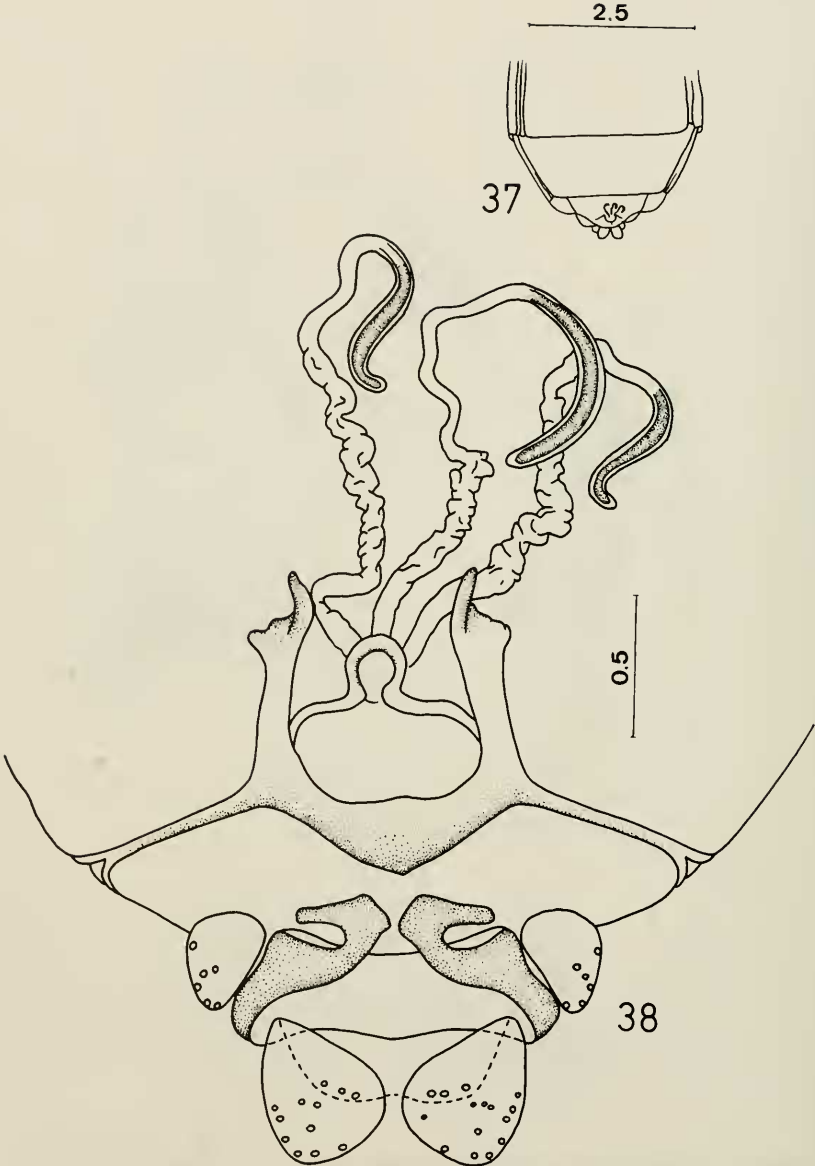
Figs. 31.32. *Pseudorhopalia mirandai* (d'Andretta & Carrera): 31. tip of abdomen showing position of spermathecae, 31A. tip abdomen, lateral view, 32. spermathecae.



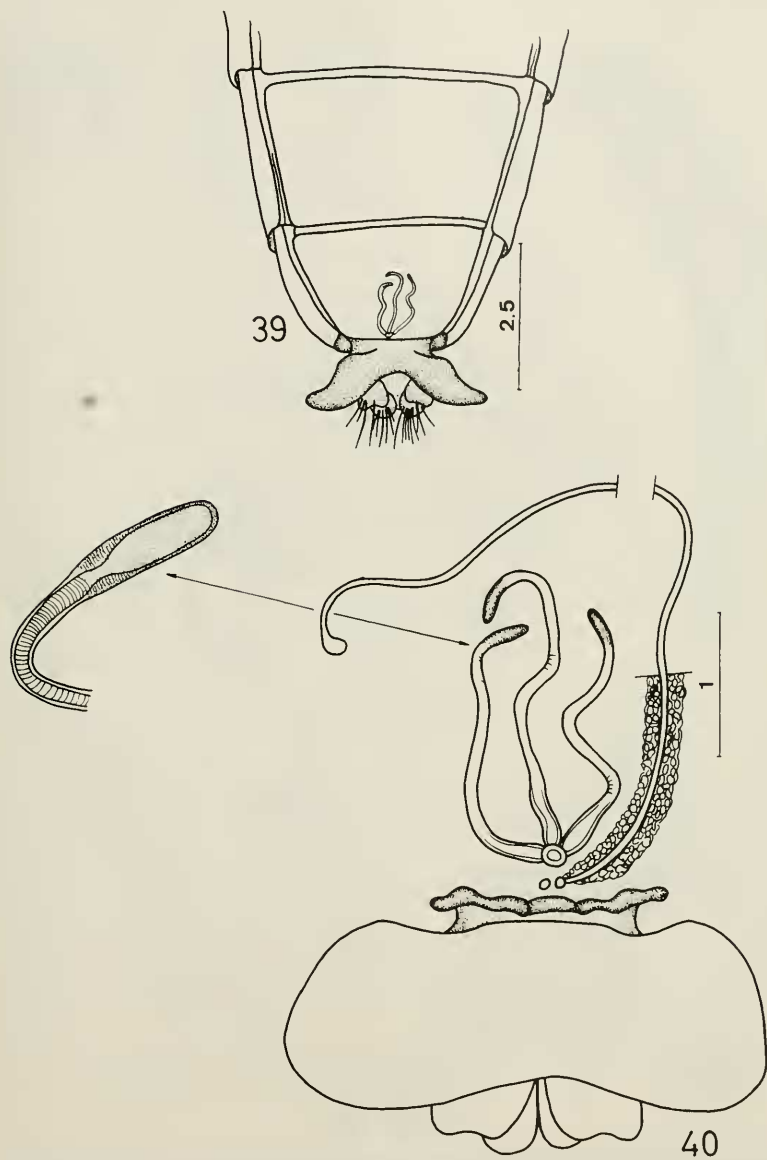
Figs. 33-34. *Miltinus viduatus* (Westwood): 33. tip of abdomen, showing position of spermathecae, 34. spermathecae and details of tips of spermathecae.



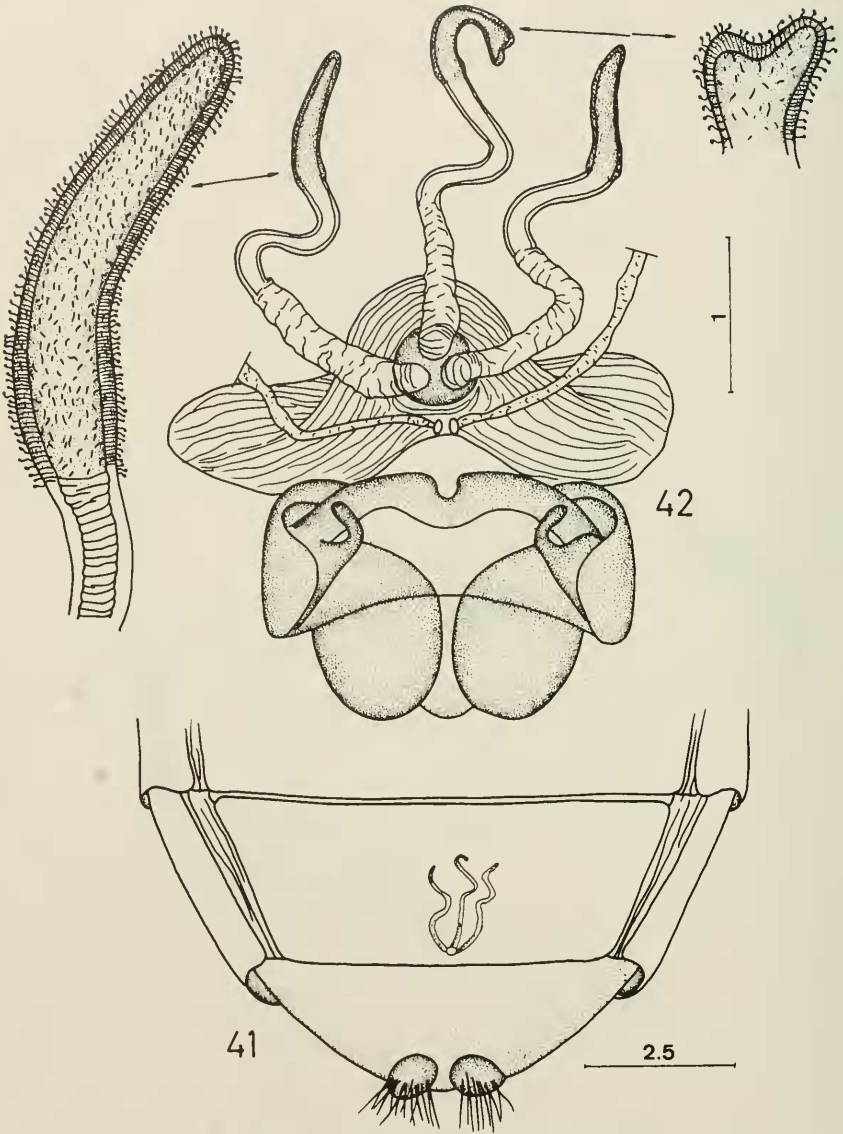
Figs. 35-36. *Dolichogaster brevicornis* (Wiedemann): 35. tip of abdomen, showing position of spermathecae, 36. spermathecae and tip of abdomen (tergite 9 flattened in the preparation).



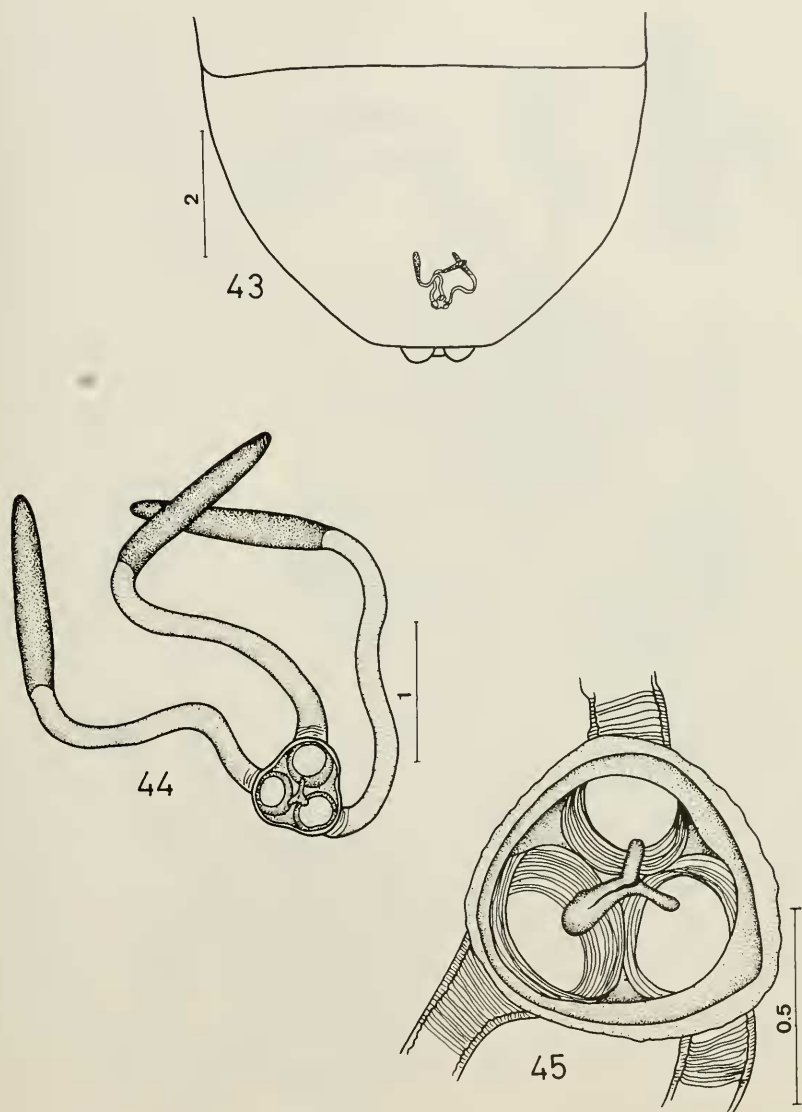
Figs. 37-38. *Messiasia dalciana* d'Andretta: 37. tip of abdomen showing position of spermathecae, 38. spermathecae.



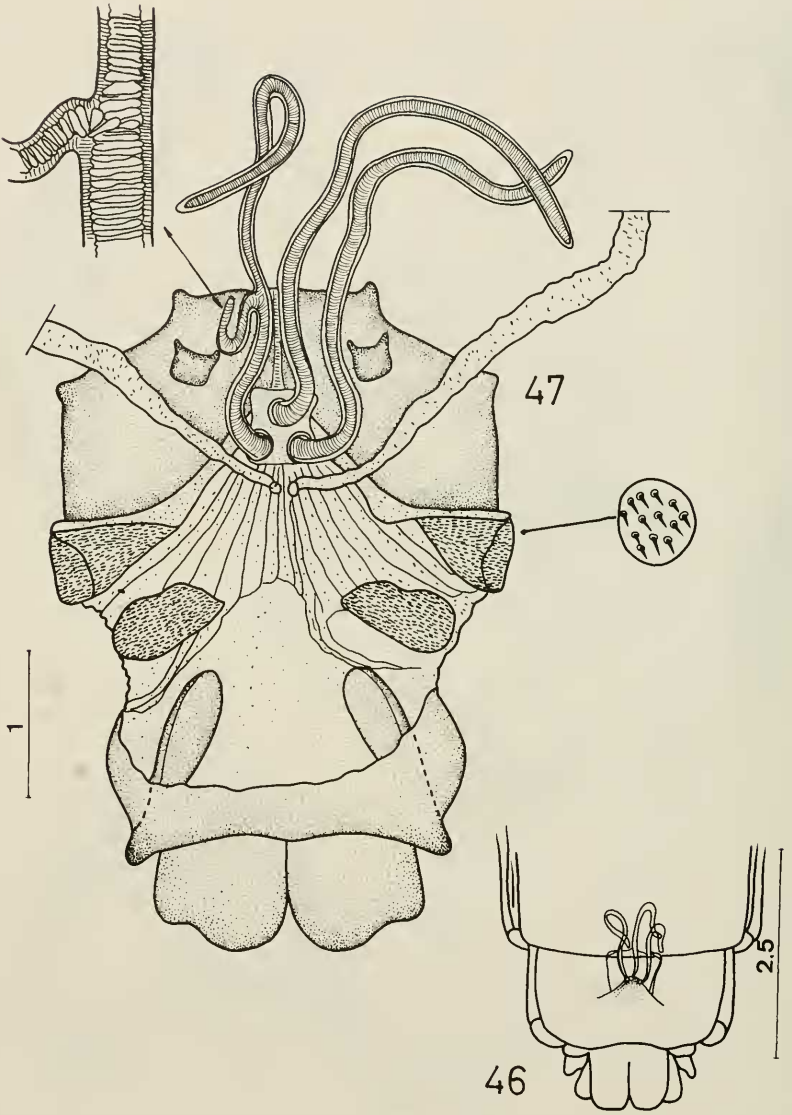
Figs. 39-40. *Phyllomydas bruessi* Johnson: 39. tip of abdomen showing position of spermathecae, 40. spermathecae.



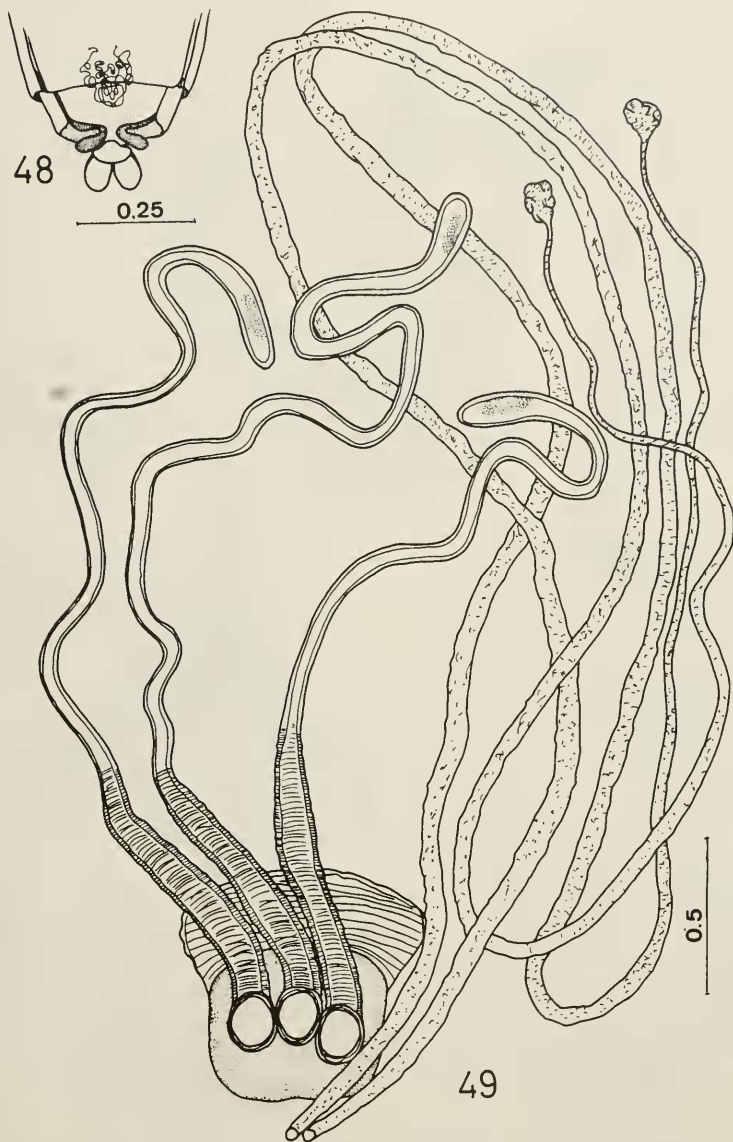
Figs. 41-42. *Protomydas coeruleuscs* (Olivier): 41. tip of abdomen showing position of spermathecae; 42. spermathecae and details (middle capsule with teratological growth).



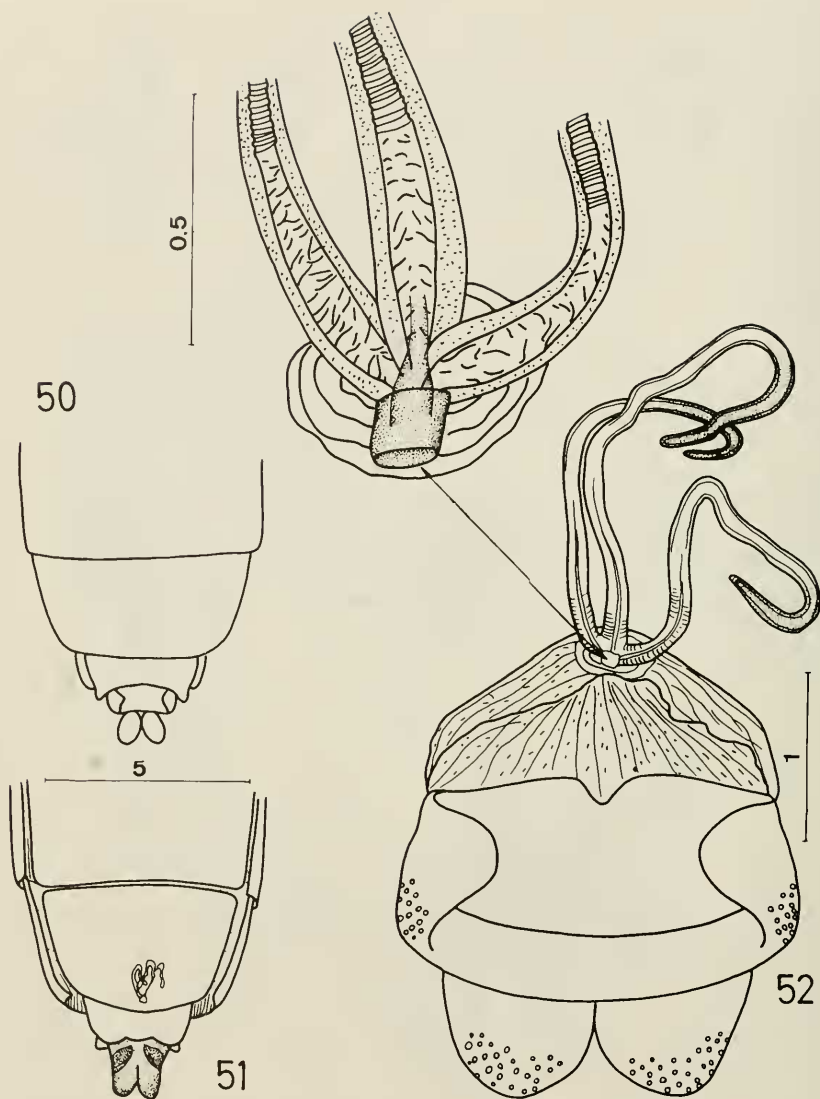
Figs. 43-45. *Gauromydas heros* (Perty): 43. tip of abdomen showing position of spermathecae; 44. spermathecae; 45. detail of confluence of the three ducts of the spermathecae.



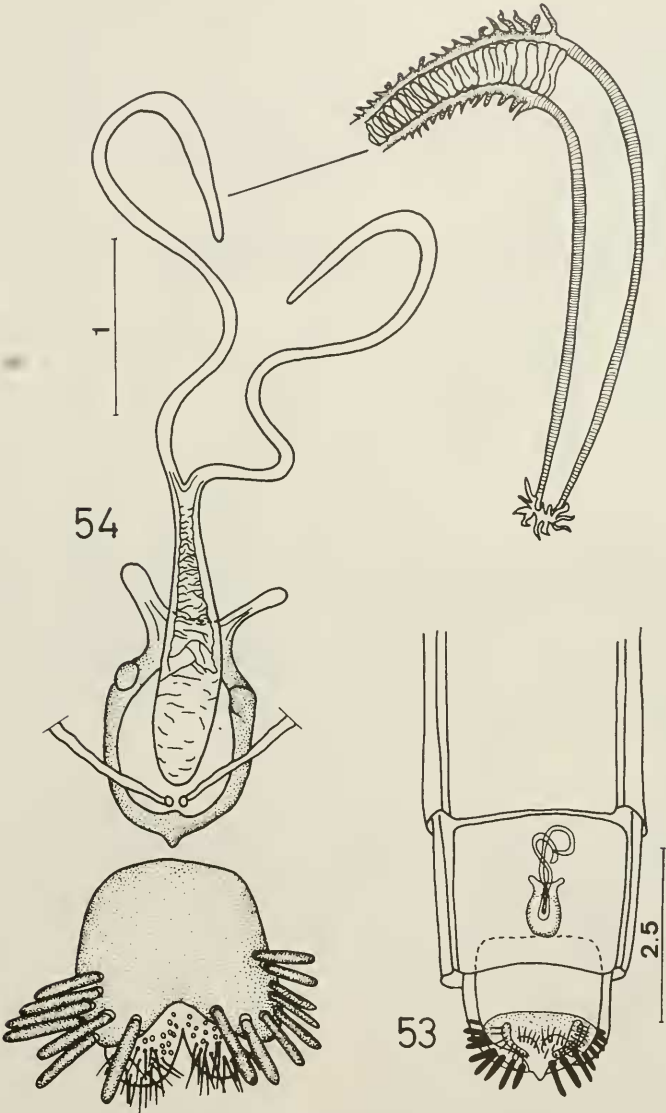
Figs. 46-47. *Mydas clavatus* (Drury): 46. tip of abdomen showing position of spermathecae; 47. spermathecae and detail of teratological growth of duct.



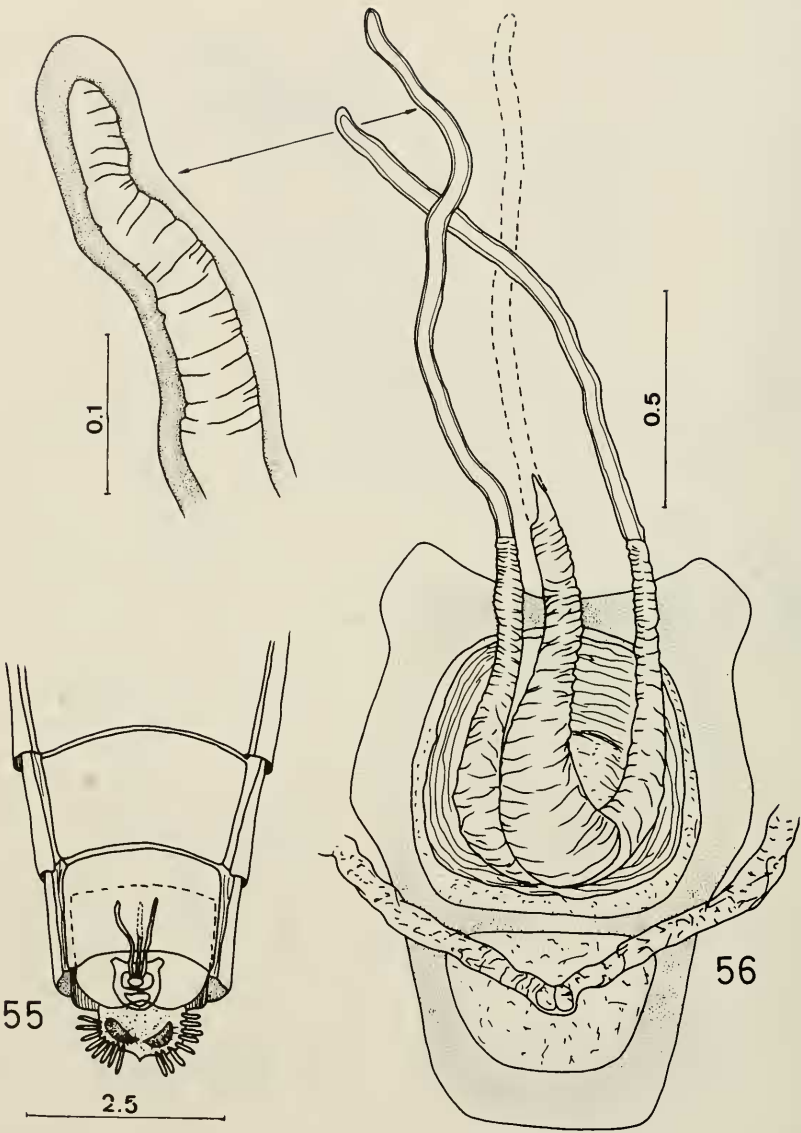
Figs. 48-49. *Ceratomydas crassipes* (Westwood); 48. tip of abdomen showing position of spermathecae; 49. spermathecae (notice extreme development of accessory glands).



Figs. 50-52. *Mapinguari politus* (Wiedemann); 50. dorsal view of apex of abdomen; 51. ventral view of tip of abdomen, showing position of spermathecae; 52. spermathecae and detail of confluence of the three ducts of the spermatheca.



Figs. 53-54. *Nemomydas pantherinus* (Gerstaecker): 53. tip of abdomen showing position of spermathecae; 54. spermathecae and detail of tip of spermatheca.



Figs. 55-56. *Pseudonomoneura hirta* (Coquillett): 55. tip of abdomen showing position of spermathecae; 56. spermathecae and detail of tip of spermatheca.